

Response and Amendment

Application No. 10/529,214

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Amendments to the Claims:

All of the claims are set forth herein with the current status of each noted and the currently amended claims showing the changes made therein. This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 - 38 (Cancelled)

39. (Previously Presented) A method for controlling web tensions in a multi- web system, wherein at least two webs (B1, B2, B3, B4) each pass separately through at least one processing step (03) and a following traction element (05) in order to be subsequently combined into a strand (13), and wherein a tension of each individual web (B1, B2, B3, B4) by itself, as well as the relative tensions in the webs (B1, B2, B3, B4) prior to being combined (B1, B2, B3, B4), are controlled, wherein the control of the tension in the at least two webs (B1, B2, B3, B4) relative to each other in a first, global control process (19), and the control of the tension of the individual webs (B1, B2, B3, B4) each for itself, are performed in local control processes (18.x) separate from the first, global control process (19) and wherein said local control processes operate independently of said global control process, wherein the first, global control process checks the tensions in the webs (B1, B2, B3, B4) in respect to each other and, in case of a deviation from a selected tension level, outputs at least one preset value for a web tension to at least one of the second, local control processes (18.x), by means of which the tension in the individual webs (B1, B2, B3, B4) by itself is controlled by means of at least one actuating member (02, 05, 16).

40. (Currently Amended) The A method of claim 39, wherein said method is adapted for the control of web tensions in a press which processes or works on paper, wherein a web tension (S) is controlled via an actuating member (02, 05, 16) by a control system (17) employing fuzzy logic in view of at least one measured value (Sx.3) by means of a

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prescription or a characteristic diagram, characterized in that a setting of the tension level of said individual webs (B1, B2, B3, B4), which are to be brought together takes place relative to each other, and by means of a the second, local control process (18) independently of a the first, global control process, wherein a control of the web tension of an individual web (B1, B2, B3, B4) as to its course and in view of threshold values takes place such that in the first, global control process a preset value for a web tension is generated by means of a first prescription or a first characteristic diagram, the preset value is supplied to a second, local control process (18) operated by fuzzy logic, and a change in the position or form of at least one term of a linguistic description of a fuzzyfication is caused in the second, local control process (18) by means of the preset value.

41. (Previously Presented) The method in accordance with claim 39, characterized in that action on an actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4) is performed only by the second, local control process (18.x) of the two control processes (18.x, 19).

42. (Previously Presented) The method in accordance with claim 39, characterized in that the first, global control process (19) does not have a direct influence on the actuating members (02, 05, 16) assigned to the individual webs (B1, B2, B3, B4), but instead provides preset desired values of the tension to be maintained prior to the bringing together of each of the webs (B1, B2, B3, B4) by means of its characteristic diagram from values (S1.3 to S4.3) of the tensions measured prior to the bringing together.

43. (Previously Presented) The method in accordance with claim 42, characterized in that said preset desired values are compared in the second, local control process (18.x) with the last valid preset desired values and, in case of a deviation, it is taken into consideration in the course of the determination of new actuating values (Sx.11, Sx.12) for at least one actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4).

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44. (Previously Presented) The method in accordance with claim 42, characterized in that, as a result of a deviation between the new and the previous preset desired values detected in the local control process (18.x), the position or form of a term in the allocation diagram of a fuzzyfication is changed.

45. (Previously Presented) The method in accordance with claim 39, characterized in that for each web (B1, B2, B3, B4) to be brought together, its web tension on its web path is controlled by its own second, local control process (18), which is different from the first, global control process (19).

46. (Previously Presented) The method in accordance with claim 39, characterized in that the actual web tensions (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to their coming together is supplied to the first, global control process (19) as input values, and the latter generates from this and a logic implemented in the global control process (19) calculated preset values of the web tensions (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to said webs coming together.

47. (Previously Presented) The method in accordance with claim 46, characterized in that the preset values are determined in accordance with a prescription, in accordance with which the further inward located one of two webs (B1, B2, B3, B4) running up on a hopper inlet roller (08) should have an equal or greater web tension.

48. (Previously Presented) The method in accordance with claim 46, characterized in that the first, global control process (19) presets a desired value for an actuating member (08, 10) working together with the strand (13).

49. (Previously Presented) The method in accordance with claim 39, characterized in that the first, global control process (19) is operated using fuzzy logic.

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50. (Previously Presented) The method in accordance with claim 39, characterized in that the actual web tension (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to their coming together, as well as the actual web tension (S1.2, S2.2, S3.2, S4.2) downstream of the processing stage (03) designed as a printing unit (03), is provided to the second, local control process (18) as input values, and the second, local control process generates from this and a logic implemented in the control process (18) a preset value of the web tension (S1.1, S2.1, S3.1, S4.1) of the individual web (B1, B2, B3, B4) upstream of the printing unit (03).

51. (Previously Presented) The method in accordance with claim 50, characterized in that in addition a preset value of the web tension (S1.1, S2.1, S3.1, S4.1) of the individual web (B1, B2, B3, B4) downstream of the printing unit (03) is generated.

52. (Previously Presented) The method in accordance with claim 50, characterized in that the preset values are determined in accordance with a prescription in accordance with which the web tension directly downstream of the printing unit (03) and prior to the bringing together does not fall below a minimum tension and does not exceed a maximum tension.

53. (Previously Presented) The method in accordance with claim 50, characterized in that the preset values are determined in accordance with a prescription in accordance with which the web tension in the area of a measuring location (04) directly downstream of the printing unit (03) and a measuring location (06) prior to the bringing together is intended to lie within a tolerance range specified for this measuring location (04, 06).

54. (Previously Presented) The method in accordance with claim 50, characterized in that a preset value of the web tension (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to being brought together is supplied to the second, local control process (18) by the first, global control process (19).

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55. (Previously Presented) The method in accordance with claim 39, characterized in that the second, local control process (18) is operated using fuzzy logic.

56. (Previously Presented) The method in accordance with claim 50, characterized in that the preset value from the first, global control process (19) causes a change of the position and/or form of at least one term for the linguistic description of the fuzzification in the second, local control process (18).

57. (Previously Presented) The method in accordance with claim 39, characterized in that preset values for web tensions are transmitted to at least one of the local and global control devices (18, 19) prior to or no later than the start-up of the processing press.

58. (Previously Presented) The method in accordance with claim 39, characterized in that the run through the local and global control processes (18x, 19) occurs parallel and each by itself in loops.

59. (Withdrawn) The method in accordance with claim 40, characterized in that the first, global control process (19) is directed to setting the relative web tension levels upstream of the hopper inlet roller (08) for the webs (B1, B2, B3, B4), which are brought together at the hopper inlet roller.

60. (Withdrawn) The method in accordance with claim 40, characterized in that the tension of individual webs (B1, B2, B3, B4) at the hopper inlet is respectively controlled to be in the principally permitted range by means of several second, local control processes (18.1, 18.2, 18.3 18.4).

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61. (Withdrawn) The method in accordance with claim 40, characterized in that the first and the second control processes (18, 19) operate independently of each other, wherein the first, global control process (19) generates preset desired values for the second, local control process (18).

62. (Withdrawn) The method in accordance with claim 61, characterized in that the first, global and second, local control processes (18, 19) in part consider the same process values.

63. (Withdrawn) The method in accordance with claim 40, characterized in that at least first and second signals regarding the measured tension of the same web (B1), namely downstream of the printing unit (03) and upstream of the bringing together (S1.3), are supplied to each one of several second, local control processes (18.1, 18.2, 18.3, 18.4).

64. (Withdrawn) The method in accordance with claim 40, characterized in that a check is made by means of the first, global control process (19) whether the tensions upstream of a harp (07) of webs (B1, B2, B3, B4), which are to be brought together, are in the desired relationship to each other, and that this is appropriately controlled by the first, global control process (19).

65. (Withdrawn) The method in accordance with claim 40, characterized in that prior to bringing the webs together, the signals (S1.3, S2.3, S3.3, S4.3) of the measured values of the web tension of the webs (B1, B2, B3, B4) are provided to the global control device (19) in parallel with each local control device (18.1, 18.2, 18.3, 18.4).

66. (Previously Presented) A device for controlling web tensions in a multi-web system with a control system (17) for setting the web tension of at least two webs (B1, B2, B3, B4), which are to be brought together after passing a processing stage (03), characterized in that the control system (17) has a first, global control device (19) and two second, local

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control devices (18) which are different from the first, global control device (19) and in principle operate independently of the first, global control device (19), wherein the second, local control devices (18) are each designed for performing a control task directed to a single web (B1, B2, B3, B4) by means of measured values of the web tension of a single web (B1, B2, B3, B4), and wherein the first, global control device (19) is designed to perform a control task directed to all webs (B1, B2, B3, B4) which are to be brought together, and wherein the first, global control device (19) generates a preset value for the local control device (18) on the basis of measured values of the web tension of all webs (B1, B2, B3, B4) which are to be brought together.

67. (Previously Presented) The device in accordance with claim 66, characterized in that only the second, local control device (18) is in a direct active connection with an actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4).

68. (Previously Presented) The device in accordance with claim 66, characterized in that at least a number of second, local control devices (18.1, 18.2, 18.3, 18.4) corresponding to the number of the whole webs (B1, B2, B3, B4) to be brought together is provided.

69. (Previously Presented) The device in accordance with claim 68, characterized in that a common first, global control device (19) is assigned to the number of second, local control devices (18.1, 18.2, 18.3, 18.4).

70. (Previously Presented) The device in accordance with claim 66, characterized in that the processing step (03) is embodied as a printing unit (03) and is provided upstream of a hopper (09) of a hopper inlet roller (08).

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71. (Previously Presented) The device in accordance with claim 72, characterized in that an actual web tension at a respective measuring location (04) downstream of the printing unit (03) and a measuring location (06) upstream of the hopper inlet roller (08) are provided as input values to the second, local control device (18.1, 18.2, 18.3, 18.4) for each corresponding web (B1, B2, B3, B4), and that a signal (S1.11) for controlling the web tension upstream of the printing unit (03) involved is provided as an output value.

72. (Previously Presented) The device in accordance with claim 71, characterized in that a signal (S1.12) for controlling the web tension downstream of the printing unit (03) involved is additionally provided as an output value.

73. (Previously Presented) The device in accordance with claim 71, characterized in that a preset value of the web tension upstream of the hopper inlet roller (08) is provided to the second control device (18).

74. (Previously Presented) The device in accordance with claim 66, characterized in that the local and global control devices (18, 19) are embodied as different software programs communicating with each other or as two processes in a software program.

75. (Previously Presented) The device in accordance with claim 66, characterized in that the local and global control processes (18, 19) are embodied as different hardware components spatially separated from each other.

76. (Previously Presented) The device in accordance with claim 66, characterized in that a memory device (21) connected with the control system (17) contains starting values for controlling the web tension.

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77. (New) A method for controlling web tensions in a multi-web system including:
- providing at least first and second separate webs;
 - passing said first web through a processing step and through a traction element;
 - providing a first local tension control process for controlling web tension in said first separate web;
 - measuring said first web's tension and generating a first web tension measurement value;
 - controlling said first web's tension using said first local tension control process to generate a first local tension control value; said first local tension control value being set, initially, at a first local preset tension value;
 - passing said second web through a processing step and through a traction element;
 - providing a second tension control process for controlling a web tension in said second web;
 - measuring said second web's tension and generating a second web tension measurement value;
 - controlling said second web's tension using said second local tension control process to generate a second local tension control value; said second local tension control value being set, initially, at a second preset tension value;
 - combining said at least first and second separate webs into a web strand;
 - wherein said first and second local tension control processes control said web tension in each of said at least first and second separate webs prior to combining said at least first and second webs into said web strand;
 - providing a global tension control process for controlling (a) total web tension in said web strand comprising at least first and second separate webs and (b) relative web tension between said first and second separate webs; wherein said global tension control process is responsive to said first web tension measurement value, said second web tension measurement value and said total web tension in said web strand;

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generating, in said global tension control process, a relative tension comparison control value in response to said first web tension measurement value, said second web tension measurement value and said total web tension in said web strand; said relative tension comparison control value being set, initially, at a global preset relative tension value;

out-putting, from said global tension control process, at least one relative tension comparison control value to one of said first and second local control processes in response to the measured web tension in one of said first and second separate webs deviating from a selected tension level; and

controlling web tension in said at least first and second separate webs using at least one of said traction elements.